NOVA SCOTIA

Environment and Labour
OCCUPATIONAL HEALTH AND SAFETY DIVISION

Lock-out:

A guide to Part 6 of the Occupational Safety General Regulations

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A GUIDE TO PART 6 - LOCK-OUT of the OCCUPATIONAL SAFETY GENERAL REGULATIONS

The information contained in this publication is a guide only and should be read with the *Occupational Safety General Regulations* for specific requirements. The Regulations are available through our web site at www.gov.ns.ca/enla/ohs/publicat.htm or copies may be requested by calling the Information Specialist at 902-424-5400 or toll-free 1-800-952-2687.

This guide provides a plain language interpretation of Part 6 - Lock-out requirements of the Occupational Safety General Regulations. It has two parts and three Appendices.

The first part contains common terms defined in Part 6. The second part contains the requirements for lock-out. The Appendices contain sample lock-out procedures and an energy source evaluation form.

NOTE: The requirements for lock-out apply to all machines, equipment, tools or electrical installations; however, for ease of understanding and writing, this guide refers to one or another of the items listed.

PART 1: Common Terms

What is meant by Lock-out?

Lock-out means ensuring a machine, tool, pipe, etc. is not able to start or transmit energy when it is being worked on. When a machine is locked-out, starting it in any way should be impossible - directly by an on/off switch or indirectly by a main power switch.

What is meant by "zero-energy state"?

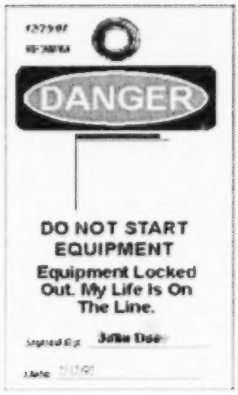
Zero-energy means there is no energy of any kind left in the machine, tool or line. For example, a tool that uses compressed air would have the air line drained of any pressure and disconnected or blocked from the air source. An electrical panel would have the electricity shut off. It means the machine or equipment cannot be operated - intentionally, by using the switch, or by mistake because some energy was left in the system.

What is a lock-out device?

A lock-out device is anything that keeps the energy source away from a machine. This could be as simple as a lock that makes a switch impossible to reach or to turn on. A lock used for this purpose should be a key lock rather than a combination lock.

What is a lock-out tag?

A lock-out tag, is a tag found at a lock-out location. The lock-out tag tells people that a machine is not to be started or operated. It also tells them who has done the lock-out. For example:



As for its physical qualities, the lock-out tag should not readily conduct electricity.

PART II: Lock-Out Requirements

Why is lock-out important?

The accidental start-up of machines because of a failure to lock-out machinery before working on it is a cause of serious injury and fatalities.

What does lock-out apply to?

Lock-out requirements apply to all machines, equipment, tools, transport pipes, high pressure lines and electrical installations.

When do I have to consider a lock-out?

Lock-out needs to be considered any time a machine is being handled outside normal work operating conditions, by a person who could be injured if the machine is started by mistake.

For example, when repairing a conveyor belt system, the source of energy to the conveyor belt needs to be locked out to ensure the repair person's safety. Lock-out requirements also apply when machinery becomes jammed.

Is access to the on/off switch enough?

No. Besides the regular control mechanism, the employer has to ensure that all sources of energy to the particular machine are readily identifiable and easily accessible when needed.

What is required for working on a machine?

When a person is working on or repairing a machine outside its normal operating conditions, the employer needs to ensure the work is:

1) done according to a written procedure, and
2) only after additional persons are cleared, when necessary, from the area.

What is a lock-out procedure?

A lock-out procedure lists the steps to be taken to make sure the machine cannot be turned on, intentionally or accidentally - in other words "locked-out". The regulations require the employer to establish a written course of action when a person is required to do work on a machine that may be hazardous if a machine were to become energized.

What should the procedure cover?

A lock-out procedure should say:

1) how to safely bring and keep a machine at zero energy
2) where and how to place appropriate lock-out devices and lock-out tags on the machine
3) how to verify lock-out effectiveness and test for zero energy state
4) how to let people know the lock-out has happened
5) how to make sure that all persons near the locked-out machine are clear of the area, and are instructed to stay clear before the machine is energized again
6) how to energize the machine again after the lock-out

The following is a sample list of things to consider when writing a lock-out procedure:

a) job objectives and equipment involved
b) detailing the energy sources for each machine and lock-out procedures
c) steps for shutting down and securing machinery
d) steps to verify lock-out effectiveness and test for zero energy
e) procedures for applying lock-out and tags
f) procedures for restarting
g) employees authorized to do lockout
h) circumstances when a person may remove another's lock

In training for lockout procedure remember that:

a) employees must understand what equipment tags mean, and what to do if they want to operate it
b) the person responsible for lock-out must be trained in the written procedure and fully knowledgeable of hazardous energies related to the equipment
c) employees reassigned to different equipment must be trained on the lock-out procedures for that equipment
d) outside contractors working on a site will need to lock-out/tag; so the contractor and employer's procedures must work together

What has to happen when work is done on a machine that could become a hazard if suddenly energized?

The following requirements need to be done before work can happen on machines that could become a hazard if suddenly energized:

1) Establish, and follow, a written lock-out procedure
2) No work done until
    i) the machine is put in and kept at a zero energy state,
    ii) it is locked-out and has a lock-out tag (at all the lock-out locations), and
    iii) a competent person verifies that i and ii have happened and the machine is tested to make sure it has zero energy

Who can remove a lock-out device?

Generally only the person who has installed the lock-out device should remove it. If the person who installed the device is not available and all reasonable attempts have been made to contact them; a competent person who has been designated in writing by the lock-out procedure may remove a lock-out device after making sure doing so is safe.

In a serious emergency - where a person's safety or health could be affected or damage to property or economic loss could occur - a person who has not been designated in writing in the lock-out procedure may remove the lock-out device after making sure it is safe to do so.

What if it is not possible to lock-out the machine or process?

There are occasions where having a lock-out condition will not be possible, for example, working on live power lines or tapping into a pressurized line. Where lock-out requirements are inappropriate for the work or not reasonably practicable the employer may substitute an alternative written safe work procedure.

The written safe work procedure must specify employer and worker responsibilities, training and equipment requirements and the details for doing the work safely.

Appendix A

Sample Lockout Procedure

1. Lockout procedure for

_____

Name of your Company

Purpose

This procedure establishes the minimum requirements for the lockout of energy sources that could cause injury to Personnel. All employees will comply with the procedure.

Responsibility

Supervisors have the responsibility for ensuring this procedure is followed. Employee's are responsible for following it. All employees will be instructed in the safety significance of the lockout procedure by (designated individual). Each new or transferred employee will be instructed by (designated individual) in the purpose and use of the lockout procedure. It is the supervisor's responsibility to have employees trained in lockout and tagging procedures.

Rules for Using Lockout Procedure

All equipment will be locked out to protect against inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy isolating device bearing a lock.

Preparation for Lockout

A list of persons authorized to do lockout/tag is posted at _____. Employees authorized to do lockout will be certain which switch, valve, or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, or others) may be involved; all sources are to be locked-out. Any questionable identification of sources will be cleared by the employees with their supervisors. Before lockout commences, job authorization should be obtained from the supervisor. Each person working on a machine must apply their own lock and tag - only a key lock will be used. The lock will have no master key and no locks will be opened by the same key.

Detailed Lockout Procedure

1. Notify all affected employees that a lockout is required and the reason it is required.

2. If the equipment is operating, the operator will shut it down by the normal stopping procedure (such as: depress a stop button, open a toggle switch).

3. Operate the switch, circuit breaker, valve, or other energy isolating devices so that the energy source(s) (electrical, mechanical, hydraulic, other) is disconnected or isolated from the equipment. Stored energy, such as that in capacitors, springs, elevated machine members, rotating fly wheels, hydraulic systems, and air, gas, steam or water pressure, must also be drained or restrained by methods such as grounding, repositioning, blocking.

or bleeding down.

4. Lockout energy isolating devices with assigned individual locks. Put a lock on all energy sources and keep the keys.

5. After ensuring that no personnel are exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate. CAUTION: Return operating controls to neutral position after the test.

6. The equipment is now locked out.

Restoring Equipment to Service

1. When the job is complete and equipment is ready for testing or normal service, check the equipment area to see that no one is exposed to a possible hazard

2. When equipment is clear, remove all locks and tags and give to supervisor for storage.

3. Restore energy to equipment.

4. Operator to restart equipment to ensure energy properly restored.

Procedure Involving More Than One Person

In the preceding steps, if more than one individual is required to work on equipment, each will place his/her personal lock on the energy isolating device(s). One designated individual of a work crew or a supervisor, with the knowledge of the crew, may lock out equipment for the whole crew. In such cases, it is the responsibility of the individual to carry out all steps and tests of the lockout procedure and inform the crew when working on the equipment is safe. Additionally, the designated individual will not remove a crew lock until it has been verified that all individuals are clear.

Appendix B
SAMPLE ENERGY SOURCE EVALUATION

DATE: ____/___/____ CONDUCTED BY: _____

To figure out all energy sources for each piece or type of machine or equipment, fill the following table.

Location: _____ Work Centre: _____

Equipment Name: _____

Model: _____ Serial #: _____

ENERGY SOURCE \ * MAGNITUDE	LOCATION OF ISOLATING DEVICE	MEANS OF ISOLATION
ELECTRICAL - power feed capacitors batteries		
ENGINE		
SPRING		
COUNTER WEIGHT		
FLYWHEEL		
HYDRAULIC		
PNEUMATIC		
CHEMICAL		
THERMAL		
OTHER		

*** Magnitude Examples : Electrical = 480v three phase; Pneumatic = 125 p.s.i.**

Appendix C

SAMPLE SPECIFIC ENERGY CONTROL PROCEDURES FOR SPECIFIC TYPES OF MACHINE OR EQUIPMENT

PROCEDURE NUMBER: _____

DATE: ____/____/____ **COMPLETED BY:** _____

MACHINES OR EQUIPMENT USING THIS PROCEDURE:

_____ _____

_____ _____

PROCEDURE FOR CONTROLLING HAZARDOUS ENERGY

1. Be familiar with the sources of hazardous energy for the machine or equipment that will be serviced.

SOURCES OF HAZARDOUS ENERGY

___ Electrical	___ Engine	___ Spring
___ Counter Weight	___ Flywheel	___ Hydraulic
___ Pneumatic	___ Chemical	___ Thermal

___ Other _____

2. Notify affected employees that the machine is about to be shut down and locked out.
Specific Instructions:

_____

_____

3. Shut down the machine using normal stopping procedures.
Specific Instructions:

_____

_____

4. Isolate all energy sources listed above.
Specific Instructions:

_____

_____

5.A. Apply locks to all isolation devices in step four.
Specific Instructions:

_____

_____

6. Block or dissipate all stored energy in rams, flywheels, springs, pneumatic or hydraulic systems, etc.
Specific Instructions:

_____
_____

7. Verify that the machine is locked out by testing the machine operating controls. RETURN ALL CONTROLS TO THE **"NEUTRAL" OR "OFF" POSITION AFTER TESTING.**
Specific Instructions:

_____
_____

PROCEDURES FOR REMOVING LOCKS / TAGS

1. Check the machine to be sure it is operationally intact, tools have been removed, and guards have been replaced.
Specific Instructions:

_____
_____

2. Check to be sure all employees are safely positioned.
Specific Instructions:

_____
_____

3. Notify all affected employees that locks / tags are going to be removed and the machine is ready for operation.
Specific Instructions:

_____
_____

4. Remove all locks, blocks, or other energy restraints.
Specific Instructions:

_____
_____

5. Restore all energy to the machine.
Specific Instructions:

_____
_____

6. Test the machine.
Specific Instructions

_____
_____

OTHER COMMENTS: